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ABSTRACT

The purpose of this study was to consider possible differences in responses to a questionnaire asking the following questions: (1) Are there significant differences in responses between the sexes in each grade, from grade seven through twelve?; (2) Are there significant differences in responses among the different grades?; and (3) Is there a significant difference in response between the high school students and the high school teachers? Using a sample of 27 teachers and 493 students, the following conclusions were drawn: (1) There is a significant difference between the opinions of secondary school teachers and the opinions of secondary school students on the topic of the population explosion. The students do not wish the imposition of education which may change their attitudes or any form of coercion. The teachers were better informed and more realistic in their attitudes; (2) There was also a trend toward more positive attitudes in the higher grades; and (3) In most cases, sex had no significant influence on opinion. (CP)

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A COMPARISON BETWEEN TEACHERS AWARE OF THE POPULATION EXPLOSION AND THEIR STUDENTS

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INTRODUCTION

The news media in the United States of America has recently described in many ways the human population explosion and its consequences. Garrett Hardin[1] listed 28 controversial concepts on this topic in his article "Can Teachers Tell the Truth About Population." These concepts served as a basis for a questionnaire which was completed by most of the students in a high school in Texas during the Spring of 1971. The 27 participants in a biology course for high school teachers supported by the National Science Foundation completed the same questionnaire during the summer of 1971 at the University of Texas at Austin. The 493 high school students had considered the issue of the population explosion in several classes and assemblies. The high school teachers were involved in an intensive study of environmental education. Both groups were considered as relatively well informed.

The purpose of this study was to consider possible differences in responses to the questionnaire. The following questions were asked: (1) Are there significant differences in responses between the sexes in each grade from grade seven through twelve? (2) Are there significant differences in responses among the different grades? (3) Is there a significant difference in response between the high school students and the high school teachers?

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THE QUESTIONNAIRE

TABLE I Questionnaire Used in the Study

Circle either A (agree) or D (disagree) to indicate your response to each of the following ideas.

1. A D There is a population problem.

2. A D Our population problem is an evil byproduct of the conquest of disease.

3. A D Conventional wars do not solve the population problem.

4. A D As regards population growth we are living in very exceptional--perhaps even abnormal---times.

5. A D The world is limited in space, resources, etc.

6. A D "Space" is no escape from our earthly population problem.

7. A D The limit of human population depends on what you assume (or want) to be the limiting factor, e.g. food, etc.

8. A D Zero population growth must soon be accepted as the normal state of affairs.

9. A D The maximum population is not the optimum population.

10. A D We must reject our traditional concept of progress which implies that technology can do no wrong.

11. A D Without the guidance of standards, measurement, and conscious controls, people will naturally breed until they are near starvation level.

12. A D If freedom to breed is not restricted, breeding will not come to an end until sheer misery acts as the controlling factor.

13. A D Population control cannot be achieved by an appeal to conscience because people vary in the extent and power of their consciences.

14. A D Population control requires coercion by some means, e.g. punitive taxes, or rewards given for desired behavior, etc.

15. A D The social control of individual breeding will ultimately be accepted as a necessity and hence compatible with freedom.

16. A D We should never send food to a starving country unless we also incorporate with this aid an effective program of birth control.

17. A D Including food in foreign aid should always be viewed as an evil act, unless it can be shown that it will diminish suffering.

18. A D Nonselective immigration is indefensible, as it results, not in a sharing of the wealth, but a sharing of poverty.

19. A D In important matters the demands of conscience must always be supported by legal sanction.

20. A D In a rich country increased population means decreased amenities, e.g. privacy, freedom, share in the nondivisible goods of the world, etc.

21. A D The good life must include a share of nondivisible goods, e.g. solitude, use of the wilderness by nature hikes, etc.

22. A D For nondivisible goods to be enjoyed by any, they must be restricted to only a few by lottery or by merit.

23. A D Because we have already overshot the optimum population, we will have to achieve a negative rate of growth for a long while.

24. A D Every "need" has at least one contradictory alternative that should be considered before reaching a decision.

25. A D Just as mass starvation cannot be eliminated by food, so also traffic problems cannot be eliminated by building more roads.

26. A D In the early stages of population control it may, for political reasons, be necessary to use largely indirect methods, e.g. taxes.

27. A D We need to tell children through public school education that it is possible to live a good life without having children.

28. A D Ultimately we may well have to come to direct coercive control of individual breeding.

Age_____ Sex_____ Grade_____

Five of these questions seem especially interesting. Questions 1 &,8 present basic issues. Questions 27 and 28 are related to attitudes

toward coercion. Question 6 involves information which is commonly misunderstood by young American.

The responses to the questions were interpreted as scores in the following way: each answer of "agree" counted as one point. The maximum score could be 28; the minimum, zero.

RESULTS

TABLE II The Differences in Response Between Sexes in Each of the Grades

Grade	Boys		Girls		t
	N	$\bar{X}$	N	$\bar{X}$	
7	64	17.03	43	16.32	0.84
8	44	16.57	32	14.59	1.66*
9	56	16.67	36	16.55	0.14
10	65	16.90	27	16.11	0.83
11	43	17.39	30	16.40	1.07
12	28	17.50	25	20.08	2.34**

* At the 10% level of significance
** At the 5% level of significance

The only significant differences between the sexes were (1) the slightly lower scores of eighth-grade girls when compared with eighth-grade boys and (2) the somewhat higher scores of twelfth grade girls when contrasted with twelfth grade boys. Because there seemed to be no general tendency for distinction between the responses of the sexes, the remaining considerations ignored the distinction between the sexes.

TABLE III The Scores of the Groups Responding to the Questionnaire

Grade	N	$\bar{X}$	S
7	107	16.88	4.23
8	76	15.74	4.99
9	92	16.63	4.12
10	92	16.67	3.92
11	73	16.98	4.09
12	53	18.72	4.18
Teachers	27	23.33	3.27
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TABLE IV t-Test Between the Scores of Each Grade

Grade	8	9	10	11	12
7	0.37	0.42	0.43	0.17	2.59***
8		1.24	0.73	1.66*	3.65****
9			0.07	0.55	2.89***
10				0.98	2.87***
11					2.34**

* Significant at 10% level
** Significant at 5% level
*** Significant at 1% level
**** Significant at .1% level

Table IV demonstrates that the average score of the twelfth-graders is significantly greater than that of any of the other students. The t-statistic for contrasting the teachers with twelfth grade girls is 3.44, which is significant at the 1% level. The teachers' scores were therefore very significantly higher than that of any group of students.

TABLE V Percentages of Each Group Responding to Five Questions of the Questionnaire

Question	Grade	Sex	N agree		N disagree		N no response	
1	7	both	100	93.4%	7	6.6%	0	0%
		boys	58	90.6%	6	9.4%	0	0%
		girls	42	97.7%	1	2.3%	0	0%
	8	both	76	100%	0	0%	0	0%
		boys	45	100%	0	0%	0	0%
		girls	31	100%	0	0%	0	0%
	9	both	89	95.7%	4	4.3&	0	0%
		boys	52	92.8%	4	7.2%	0	0%
		girls	36	100%	0	0%	0	0%
	10	both	92	100%	0	0%	0	0%
		boys	65	100%	0	0%	0	0%
		girls	27	100%	0	0%	0	0%
	11	both	71	97.3%	2	2.7%	0	0%
		boys	41	95.4%	2	4.6%	0	0%
		girls	30	100%	0	0%	0	0%
	12	both	53	100%	0	0%	0	0%
		boys	28	100&	0	0%	0	0%
		girls	25	100%	0	0%	0	0%
	teachers,	both	27	100%	0	0%	0	0%

Question	Grade	Sex	N	agree	N	disagree	N	no response
6	7	both	58	54.2%	49	45.8%	1	0.9%
		boys	30	46.2%	35	53.8%	0	0.0%
		girls	28	65.2%	14	32.5%	1	2.3%
	8	both	37	48.7%	39	51.3%	0	0%
		boys	25	55.5%	20	44.5%	0	0%
		girls	12	38.7%	19	61.3%	0	0%
	9	both	38	40.8%	53	57.0%	2	2.2%
		boys	25	44.6%	30	53.6%	1	1.8%
		girls	13	35.2%	23	62.0%	1	2.8%
	10	both	50	54.4%	42	45.6%	0	0%
		boys	33	50.8%	32	49.2%	0	0%
		girls	17	63.0%	10	37.0%	0	0%
	11	both	37	50.7%	33	45.2%	3	4.1%
		boys	21	48.8%	20	46.6%	2	4.6%
		girls	16	53.3%	13	43.3%	1	3.3%
	12	both	29	54.7%	24	45.3%	0	0%
		boys	11	39.3%	17	60.7%	0	0%
		girls	18	72.0%	7	28.0%	0	0%
	teachers	both	22	81.5%	5	18.5%	0	0%
8	7	both	58	54.2%	47	44.9%	1	0.9%
		boys	33	52.4%	30	47.6%	0	0%
		girls	25	58.2%	17	39.5%	1	2.3%
	8	both	36	47.49%	38	50.0%	2	2.6%
		boys	19	42.3%	25	55.5%	1	2.2%
		girls	17	54.8%	13	41.9%	1	3.3%
	9	both	33	35.5%	59	63.4%	1	1.1%
		boys	17	30.4%	39	69.6%	0	0%
		girls	16	43.3%	20	54.1%	1	2.6%
	10	both	51	55.4%	41	44.6%	0	0%
		boys	40	61.5%	25	38.5%	0	0%
		girls	11	40.7%	16	59.3%	0	0%
	11	both	33	45.2%	40	54.8%	0	0%
		boys	21	48.8%	22	51.2%	0	0%
		girls	12	40.0%	18	60.0%	0	0%
	12	both	30	56.6%	23	43.3%	0	0%
		boys	12	42.1%	16	57.1%	0	0%
		girls	18	72.0%	7	28.0%	0	0%
	teachers	both	27	100%	0	0%	0	0%

Question	Grade	Sex	N	agree	N	disagree	N	no response
27	7	both	42	37.4%	67	62.6%	0	0%
		boys	27	39.1%	39	60.9%	0	0%
		girls	15	34.9%	28	65.1%	0	0%
	8	both	26	34.7%	44	58.8%	5	6.5%
		boys	18	40.9%	24	54.6%	2	4.5%
		girls	8	25.8%	20	64.5%	3	9.7%
	9	both	41	44.6%	52	55.4%	0	0%
		boys	24	42.8%	32	57.2%	0	0%
		girls	17	46.0%	20	54.0%	0	0%
	10	both	38	41.3%	52	56.5%	2	2.2%
		boys	30	46.1%	33	50.8%	2	3.1%
		girls	8	29.6%	19	70.4%	0	0%
	11	both	33	45.2%	39	53.4%	1	1.4%
		boys	22	51.2%	20	46.5%	1	2.3%
		girls	11	36.7%	19	63.3%	0	0%
	12	both	31	58.5%	22	41.5%	0	0%
		boys	14	50.0%	14	50.0%	0	0%
		girls	17	68.0%	8	32.0%	0	0%
	teachers	both	21	77.8%	5	18.5%	1	3.7%
28	7	both	66	61.7%	38	35.5%	3	2.8%
		boys	43	67.2%	21	32.8%	0	0%
		girls	23	53.5%	17	39.5%	3	7.0%
	8	both	37	48.7%	28	36.8%	11	14.5%
		boys	24	53.3%	17	37.8%	4	8.9%
		girls	13	41.9%	11	35.5%	7	22.6%
	9	both	52	56.5%	39	42.4%	1	1.1%
		boys	36	64.3%	19	33.9%	1	1.8%
		girls	16	44.4%	20	55.6%	0	0%
	10	both	44	47.8%	42	45.6%	6	6.6%
		boys	33	50.8%	27	41.5%	5	7.7%
		girls	11	40.7%	15	55.6%	1	3.7%
	11	both	39	53.5%	32	43.8%	2	2.7%
		boys	24	55.8%	18	41.9%	1	2.3%
		girls	15	50.0%	14	46.3%	1	3.3%
	12	both	33	62.3%	20	37.7%	0	0%
		boys	14	50.0%	14	50.0%	0	0%
		girls	19	76.0%	6	24.0%	0	0%
	teachers	both	25	92.6%	2	7.4%	0	0%

CONCLUSIONS

In general there seemed to be no difference in response to the questionnaire between the sexes in grades seven through twelve. Nevertheless the [illegible]

the girls in grade twelve were significantly more in agreement with the statements of the questionnaire that any other group of students. The high school teachers were significantly more in agreement with the statements than even the girls of grade twelve.

The combined mean score of both the boys and the girls of grade twelve was significantly higher than that of any other grade. The average scores showed a trend that as the groups became older, the scores became higher.

All of the groups almost unaminously agreed with the first statement: "There is a population problem."

Question 6 required a judgment on the use of travel in space as a solution to our human population problem. Approximately half of the high school students believed that apace can offer an escape. On the other hand, the teachers rather strongly considered "space" as no solution. The teachers usually balanced the cost of space travel against the immense numbers now in the population explosion.

Question 8 asked for agreement or disagreement on accepting zero population growth as the normal state of affairs. The teachers unanimously accepted this idea. Although the girls of grade twelve generally accepted this principle, approximately half of the high school students rejected it. Students in the ninth grade rejected the principle by a ratio of almost two to one.

Question 27 suggests that in the pbulic schools, children should learn that "it is possible to live a good life without having children." There was a definite trend for the older students to agree with the statement while the younger students disagreed. Nevertheless approximately half of all the

students rejected such "education." Almost one fifth of the teachers also rejected the idea.

The final question states that we amy have to come to direct coercive control of individual breeding." Almost all of the teachers accepted this statement. On the other hand, only slightly more than half of the students accepted this idea.

SUMMARY

There is a significant difference between the opinions of secondary school teachers and the opinions of secondary school students on the topic of the population explosion. Stronck[2] has explained the need for including this topic in the modern curriculum. But Stronck[3] also recognized that teachers are often reluctant to present controversial topics. This survey demonstrated that the students do not wish the imposition an education which may change their attitudes or any form of coercion. The teachers are better informed and more realistic in their attitudes. They will need the support of school administrators and other informed adults to proceed with the needed project of population education.

FOOTNOTES AND REFERENCES

1. Hardin, Garrett. "Can Teachers Tell the Truth About Population?" in Social Implications of Biological Education, edited by Arnold B. Grobman. National Association of Biology Teachers, Washington D.C., 1970. pp. 97-116.

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